

## SAFETY PRECAUTIONS

### SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

### SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

### X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

### GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check inner board wiring for pinched wires or wires contacting any high wattage resistors. Check that all control knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

#### TEST JIG HOOKUP

Function	Chek-A-Color Adapter No.	PC Board Plug No.	Pin	Color
CRT	B239	P401	7	Red
Yoke	D4137		8	Blue
Yoke Setting	YP1		9	Yellow
Comments	Focus Tap		10	Green

#### HIGH VOLTAGE SHUTDOWN TEST

Apply 120VAC and turn receiver on. Set all digital customer controls for normal operation. Momentarily short test point X to test point R. Receiver should lose raster and sound. If the receiver does not lose raster and sound, the shutdown circuit should be repaired. To resume normal operation, remove AC power and wait 30 seconds. After restoring AC power, the receiver should power up automatically.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by Howard W. Sams & Company as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to Howard W. Sams & Company by the manufacturers of the specific type of replacement part listed.

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Page 1 SET 4168



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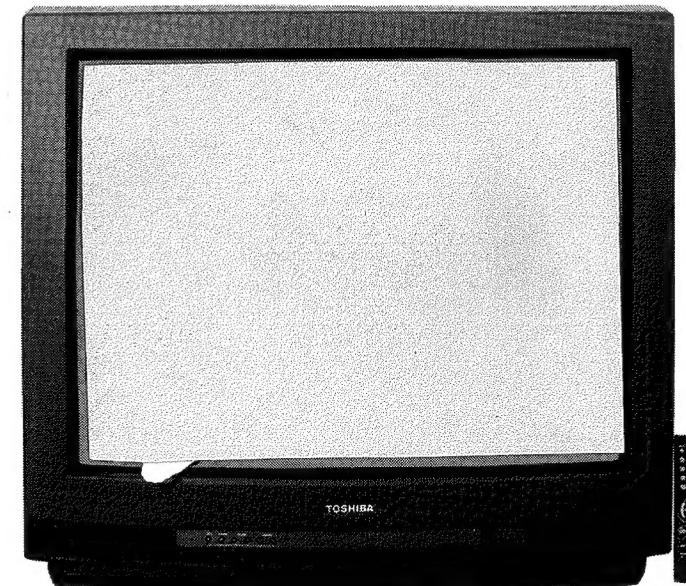


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# PHOTOFAC<sup>®</sup> Technical Service Data

**TOSHIBA**

Model CF36H40 (Chassis TAC9808)



SET 4168

MODEL CF36H40 (CHASSIS TAC9808)

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Essential coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts list

For Supplier Address,  
See PHOTOFAC Annual Index



**HOWARD W. SAMS & COMPANY**

JULY 1999 SET 4168

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## TUNER / IF MODULE INFORMATION

## TUNER / IF MODULE VOLTAGE CHART

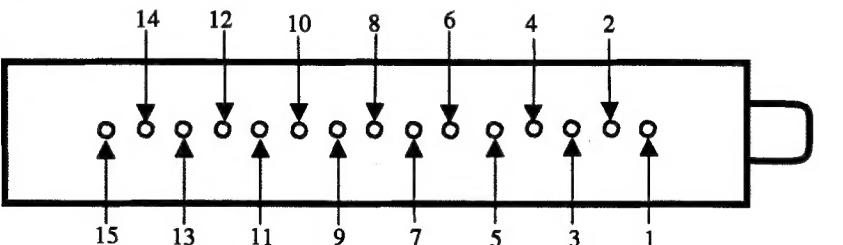
Pin	Function	VHF Low Band	VHF High Band	UHF Band
1	NC	0V	0V	0V
2	+32V	33.0V	33.0V	33.0V
3	SCL	4.5V	4.5V	4.5V
4	SDA	4.5V	4.5V	4.5V
5	NC	0V	0V	0V
6	ADS	4.7V	4.7V	4.7V
7	+5V	5.0V	5.0V	5.0V
8	RF AGC	4.3V	4.2V	3.9V
9	9V	9.0V	9.0V	9.0V
10	A OUT	3.5V	3.5V	3.5V
11	GND	0V	0V	0V
12	AFT	3.9V	4.0V	3.9V
13	NC	0V	0V	0V
14	GND	0V	0V	0V
15	V OUT	4.5V	4.5V	4.5V

NOTE: VHF Low Band voltages taken on channel 2.

VHF High Band voltages taken on channel 7.

UHF Band voltages taken on channel 14.

## TUNER / IF MODULE TERMINAL GUIDE



## SCHEMATIC NOTES

# For SAFETY use only equivalent replacement part, see parts list.

\* Circuitry not used in some versions.

--- Circuitry used in some versions.

† Ground

〃 Chassis ground

▽ Common tie point

△ Taken from common tie point

3 Schematic CIRCUITRACE® Voltage source tie point.

A Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless noted otherwise.

Waveforms taken with triggered scope and colorbar signal.

Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.

Supply voltages maintained as seen at input.

Voltages measured with digital meter and a 1000 $\mu$ V RF signal, with colorbar pattern, applied to antenna terminal.

Controls adjusted for normal operation.

Capacitors are 50 volts or less, 5% or greater unless noted.

Electrolytic capacitors are 50 volts or less,

20% or greater unless noted.

Resistors are 1/2W or less, 5% or greater unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Rated voltage shown on zener diodes.

## MISCELLANEOUS ADJUSTMENTS

## HIGH VOLTAGE CHECK

Tune in a picture. Set brightness, contrast, and color to minimum. Connect a high voltage probe to the CRT anode. High voltage should read 32kV to 33kV.

## WHITE BALANCE (RCUT, GCUT, BCUT, GDRV, BDRV)

Turn receiver on. Allow a 10 to 30 minute warm up time. Adjust contrast to center and brightness to maximum. Enter the service mode. Press the TV/video button on remote repeatedly until the white screen pattern is displayed. Select items RCUT, GCUT, BCUT, GDRV, and BDRV and set the reference value for each to 40H. Press the TV/Video button on the remote to obtain a single horizontal line. Advance the screen control until a faint line of one predominant color appears on the screen. Adjust the other two cutoff items to obtain a dim white line. Press the TV/Video button on the remote to get full deflection. Select items GDRV and BDRV and adjust reference value of each for the best black and white picture on screen.

## PURITY / CONVERGENCE

This model uses a bonded yoke and adjustments are not recommended.

## ENTERING THE SERVICE AND DESIGN MODES

To enter the service mode, press the mute button on the remote. Press the mute button again and keep pressing while simultaneously pressing the menu button on the receiver. The letter S will appear on the screen indicating that the receiver is in the service mode.

To enter the design mode, enter the service mode and press the recall button on the remote and keep pressing while simultaneously pressing the menu button on the receiver. The letter D will appear on the screen indicating that the receiver is in the design mode.

When in the service mode or design mode, press the menu button on the receiver to display the adjustment menu. To select the item to be adjusted, press the channel up or down button. To adjust the reference value, press the volume up or down button. To exit from the service mode or the design mode, press the power button to turn off the receiver.

## SELF DIAGNOSTIC FUNCTION

Enter the service mode. Press the 9 button on the remote to check for proper execution of IC interfacing. The following is an explanation of what is displayed on screen:

Display	Explanation
[SELF CHECK] No. 23906358 POWER : 000	Self diagnostic function. Part number of QA01. Operation number of protecting circuit. 000 display is normal.
BUS LINE : OK	BUS line check. OK is normal. NG indicates a short to ground of the SCL or SDA signal or a short between SCL and SDA.
BUS CONT : OK	Bus line acknowledge check. OK is normal. A location number is NG. NG QA02 indicates QA02 is bad.
BLOCK : UV V1 QV01	Green display indicates normal. Cyan display indicates no check. Red display indicates failure. Red display indicates NG. UV indicates TV mode, V1 indicates Video 1 mode.

## TEST SIGNAL SELECTION

Enter the service mode. Press the TV/video button on the remote to display the built-in test patterns in the following order:

Normal picture, red raster, green raster, blue raster, black screen, white screen, black screen with white window, black crossbar, white crossbar, black crosshatch, white crosshatch, black crossdot, white crossdot, and back to normal picture.

NOTE: If a video cable is connected to the video input jack, the built-in test patterns will not be displayed on the screen.

## INITIALIZATION OF QA02

NOTE: QA02 must be initialized after replacement.

Enter the service mode. Press the recall button on the remote and keep pressing while simultaneously pressing the channel up button on the receiver. The initialization of QA02 is complete. Program channels into memory.

## ITEM BUTTONS

The following is a list of the buttons on the remote that will go to an item or perform a different function of the service mode:

1 RCUT	5 COLC
2 GCUT	6 TNTC
3 BCUT	8 Toggles Audio test signal on and off.
4 SCNT	9 Self Diagnostics

## SUB COLOR (COLC) &amp; SUB TINT (TNTC)

Tune in a color bar pattern. Set contrast to maximum and brightness to midrange. Connect an oscilloscope to the red cathode. Enter the service mode. Select item COLC and adjust reference value to obtain 150Vp-p. Tune in an active channel. Select item TNTC and adjust reference value for proper flesh tones.

## SUB BRIGHTNESS (BRTC)

Tune in a picture. Set contrast to minimum. Enter the service mode. Select item BRTC, adjust reference value until vertical retrace line just disappears. Adjust contrast for normal picture. Perform Height (HIT) adjustment.

## HORIZONTAL POSITION (HPOS) &amp; VERTICAL POSITION (VPOS)

Enter the service mode. Press the TV/video button on remote until a crossbar pattern is displayed. Select item HPOS or VPOS and adjust reference value for the horizontal and vertical position alternately until the pattern is centered on the screen. Check the position of the picture with off-air signal.

## HEIGHT (HIT)

Enter the service mode. Press the TV/video button on remote until a crosshatch pattern is displayed. Select item HIT and adjust reference value for slight underscan. Advance the data value by 8 steps and check the vertical position of the picture.

## WIDTH (WID)

Enter the service mode. Press the TV/video button on remote until a crosshatch pattern is displayed. Select item WID, adjust reference value for slight underscan. Advance the reference value by 7 steps. Check for proper horizontal position of the picture.

## MISCELLANEOUS ADJUSTMENTS continued

## E-W PARABOLA (DPC)

Enter the service mode. Press the TV/video button on remote until a crosshatch pattern is displayed. Select item DPC, adjust reference value for straight vertical lines on both sides of the pattern.

## STEREO ADJUSTMENTS

## Attenuator (ATT)

Connect an MTS TV/Stereo generator to antenna terminals. Select pilot, 1kHz audio frequency, and R modulating signal. Connect an oscilloscope to pin 41 of QG01. Enter the service mode. Select item ATT, adjust reference value for 1.55Vp-p.

## Stereo VCO (STVC)

Short across resistor RG44, connect a frequency counter to pin 41 of QG01. Enter the service mode. Select item STVC, adjust reference value to obtain a reading of 15.73kHz. Remove the short.

## SAP VCO (SAVC)

Short across resistor RG44, connect 1M ohms resistor between pin 12 of QG01 and ground. Connect a frequency counter to pin 41 of QG01. Enter the service mode. Select item SAVC, adjust reference value to obtain a reading of 78.67kHz. Remove the short and the resistor.

## Stereo Filter (STRF)

Remove the solder link at SL02 (located beside pin 10 of H001). Inject a signal of 15.734kHz, 1Vp-p to the junction of RG43 and RG44. Connect an oscilloscope to pin 41 of QG01. Enter the service mode. Select item STRF, adjust reference value to obtain minimum AC noise on the oscilloscope. Resolder the link at SL02.

## Stereo Separation (WBAN) and Spectral (SPEC)

Connect an MTS TV/Stereo generator to antenna terminals. Select stereo mode on receiver. Select pilot, 300Hz audio frequency, and left modulating signal. Connect an oscilloscope to pin 41 of QG01. Enter the service mode. Select item WBAN, adjust reference value for minimum amplitude of waveform on the scope. Change audio frequency to 8kHz. Select item SPEC, adjust reference value for minimum amplitude of waveform. Repeat until no further adjustment results in an amplitude decrease of waveforms.

## Test Audio Signal (1KHz) On and Off

Enter the service mode. Press the 8 button on remote to toggle the test audio signal (1kHz) on and off.

## SERVICE MODE ADJUSTMENT CHART

Item	Adjustment Name	Direct Button	Reference Value	On-set Value
RCUT (1)	Red Cutoff	1	40H	6CH
GCUT (1)	Green Cutoff	2	40H	64H
BCUT (1)	Blue Cutoff	3	40H	40H
GDRV (1)	Green Drive	-	40H	3EH
BDRV (1)	Blue Drive	-	40H	41H
SCNT (1)	Sub Contrast	4	08H	07H
BRTC (1)	Sub Brightness	-	40H	48H
COLC (1)	Sub Color	5	40H	40H
TNTC (1)	Sub Tint	6	40H	49H
ATT (1)	Attenuator	-	20H	1BH
STVC (1)	Stereo VCO	-	20H	29H
STRF (1)	Stereo Filter	-	20H	2BH
WBAN (1)	Stereo Separation	-	20H	26H
SPEC (1)	Spectral	-	20H	18H
SAVC (1)	SAP VCO	-	20H	25H
MFT (1)	-	-	FFH	
HPOS (1)	Horizontal Position	-	15H	13H
VPOS (1)	Vertical Position	-	03H	04H
HIT (1)	Height	-	20H	29H
LIN (1)	Vertical Linearity	-	07H	07H
VSC (1)	V-S Correction	-	05H	02H
VPS (1)	Vertical Shift	-	-	1BH
VCP (1)	Vertical Compensation	-	-	03H
WID (1)	Width	-	1CH	37H
DPC (1)	E-W Parabola	-	0FH	1BH
CNR (1)	E-W Corner	-	08H	07H
TRAP (1)	Trapezium	-	0AH	09H
HCP (1)	Horizontal Compensation	-	-	00H
VFC (1)	V-F Correction	-	-	0FH
PCOL (1)	PIP Color	-	91H	91H
PHUE (1)	PIP Hue	-	09H	09H
PBRT (1)	PIP Brightness	-	-	0DH

(1) May need adjustment when replacing QA02 or Q501.

## DESIGN MODE ADJUSTMENT CHART

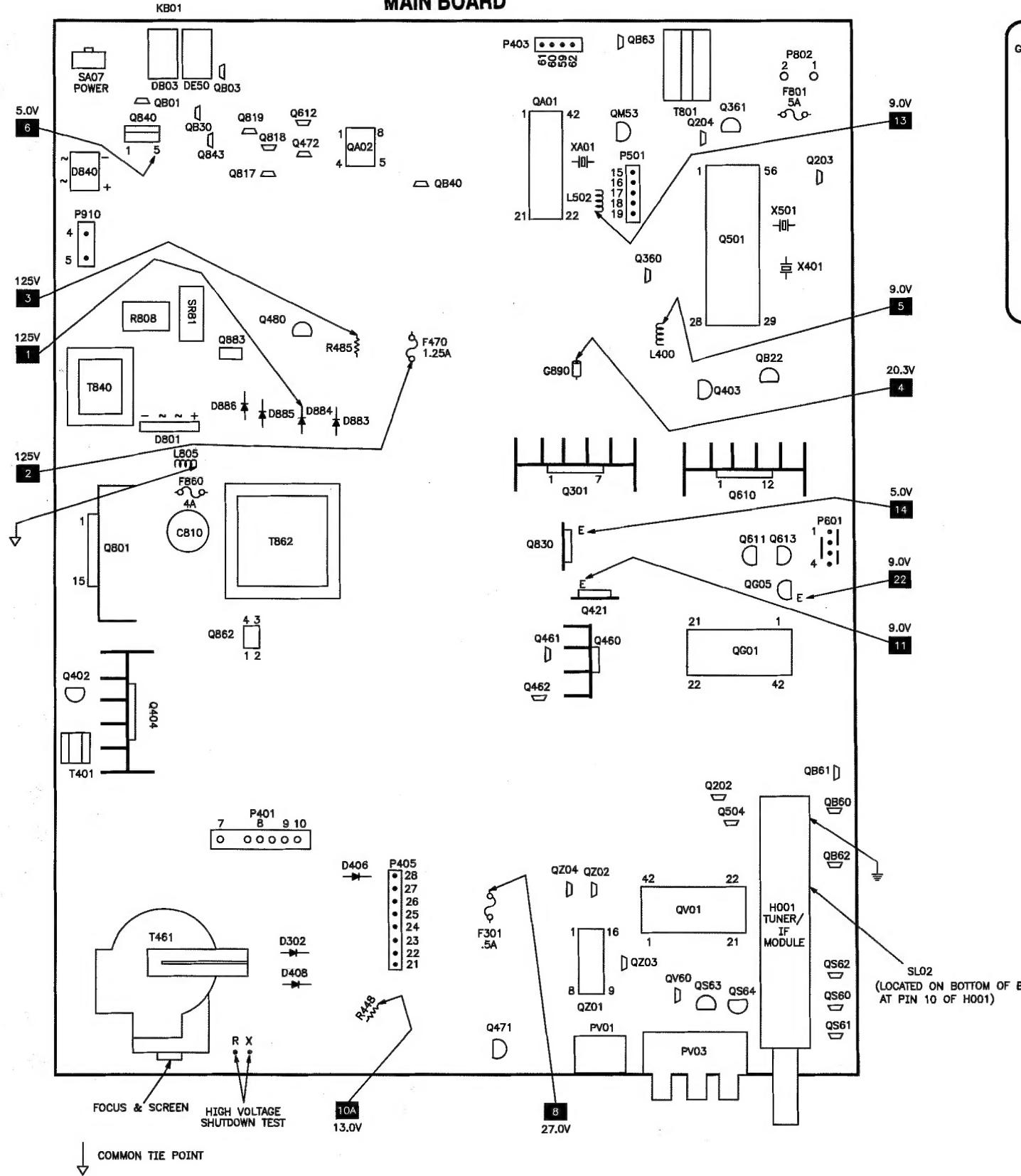
Item	Adjustment Name	Direct Button	Reference Value	On-set Value
PBRT (1)	PIP Brightness	-	-	0DH
BGST	-	-	-	4FH
PI28	-	-	-	83H
PCL2	-	-	-	37H
EXBG	-	-	-	1DH
EXB2	-	-	-	7FH
PVSS	-	-	-	2AH
PVSW	-	-	-	00H
ACCL	-	-	-	15H
DFGT	-	-	-	DFH
PRST	-	-	-	7FH
ADJ6	-	-	-	04H
PWR	-	-	-	00H
BUS	-	-	-	00H
MEM	-	-	-	00H
OPT0 (1)	Option 0	-	00H	22H
OPT1 (1)	Option 1	-	82H	80H
BASC	-	-	-	1FH
TREC	-	-	-	1FH
OSCT	-	-	-	08H
OSBR	-	-	-	00H
OSCL	-	-	-	F7H
OSTT	-	-	-	FEH
SHPX	-	-	-	12H
SHPN	-	-	-	12H
OSPT	-	-	-	00H
OSPV	-	-	-	00H
RGBB	-	-	-	08H
ORGB	-	-	-	00H
CNTX	-	-	-	3FH
OMRC	-	-	-	00H
OMGC	-	-	-	04H
OMBC	-	-	-	08H
OTRC	-	-	-	00H
OTGC	-	-	-	07H
OTBC	-	-	-	0EH
OMGD	-	-	-	F7H
OMBD	-	-	-	F0H
OTGD	-	-	-	F0H
OTBD	-	-	-	E3H
OVM0	-	-	-	F8H
VM1	-	-	-	09H
VD	-	-	-	E3H
SYNN	-	-	-	04H
SYNX	-	-	-	04H
SYCN	-	-	-	44H
SYCX	-	-	-	4DH
CHAT	-	-	-	2AH
VCHP	-	-	-	19H
CCOP	-	-	-	0AH
SHPS	-	-	-	0AH
OSPS	-	-	-	12H
OSD	-	-	-	32H
RCUT (1)	Red Cutoff	1	40H	57H
GCUT (1)	Green Cutoff	2	40H	16H
BCUT (1)	Blue Cutoff	3	40H	97H
GDRV (1)	Green Drive	-	40H	16H
BDRV (1)	Blue Drive	-	40H	A9H
SCNT (1)	Sub Contrast	4	08H	32H
BRTC (1)	Sub Brightness	-	40H	44H

(1) May need adjustment when replacing QA02 or Q501.

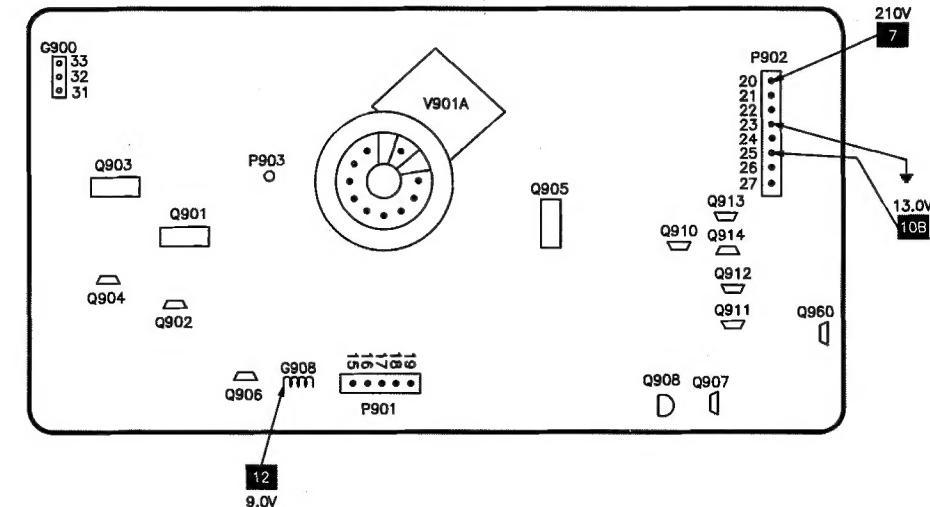
Item	Adjustment Name	Direct Button	Reference Value	On-set Value
COLC (1)	Sub Color	5	40H	40H
TNTC (1)	Sub Tint	6	40H	49H
CNTC	Contrast Center	-	-	20H
CNTN	Contrast Minimum	-	-	06H
BRTX	Brightness Maximum	-	-	17H
BRTN	Brightness Minimum	-	-	17H
COLX	Color Maximum	-	40H	60H
COLN	Color Minimum	-	-	04H
TNTX	Tint Maximum	-	-	1BH
TNTN	Tint Minimum	-	-	1BH
SHPT	RF Sharpness Center	-	-	24H
SHPV	Video Sharpness Center	-	-	20H
VMO	VCD Bit Data	-	-	63H
ATT (1)	Attenuator	-	20H	1BH
STVC (1)	Stereo VCO	-	20H	29H
STRF (1)	Stereo Filter	-	20H	2BH
WBAN (1)	Stereo Separation	-	20H	26H
SPEC (1)	Spectral	-	20H	18H
SAVC (1)	SAP VCO	-	20H	25H
MFT	-	-	-	FFH
HPOS (1)	Horizontal Position	-	15H	13H
VPOS (1)	Vertical Position	-	03H	04H
HIT (1)	Height	-	20H	29H
LIN (1)	Vertical Linearity	-	07H	07H
VSC (1)	V-S Correction	-	05H	02H
VPS (1)	Vertical Shift	-	-	1BH
VCP (1)	Vertical Compensation	-	-	03H
WID (1)	Width	-	1CH	37H
DPC (1)	E-W Parabola	-	0FH	1BH
CNR (1)	E-W Corner	-	08H	07H
TRAP (1)	Trapezium	-	0AH	09H
HCP (1)	Horizontal Compensation	-	-	00H
VFC (1)	V-F Correction	-	-	0FH
PCOL (1)	PIP Color	-	91H	91H
PHUE (1)	PIP Hue	-	09H	09H
EXTP	-	-	-	E3H
PYD6	-	-	-	04H
PYD9	-	-	-	04H
WHP6	-	-	-	44H
WHP9	-	-	-	4DH
YCON	-	-	-	2AH
PSYN	-	-	-	19H
WKY	-	-	-	0AH
WKYS	-	-	-	0AH
WKC	-	-	-	12H
WKCS	-	-	-	32H
PBST	-	-	-	57H
PVU9	-	-	-	16H
PVD9	-	-	-	97H
PVU6	-	-	-	16H
PVD6	-	-	-	A9H
PVW6	-	-	-	32H
PVW9	-	-	-	44H
PHL9	-	-	-	09H
PHR9	-	-	-	6DH
PHL6	-	-	-	09H
PHR6	-	-	-	7AH
PHW6	-	-	-	27H
PHW9	-	-	-	35H
HADJ (1)	OSD Horizontal Position	-	-	84H

## PLACEMENT CHART

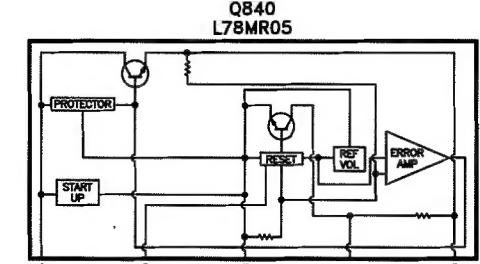
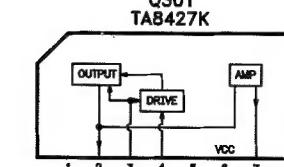
## MAIN BOARD



## CRT BOARD



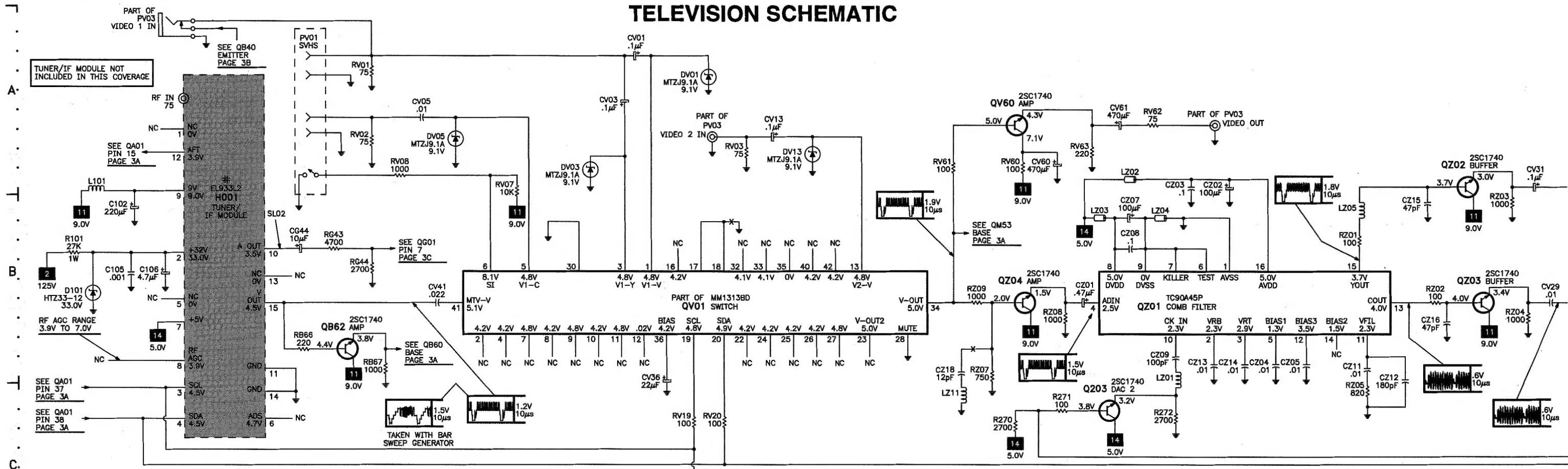
## IC FUNCTIONS



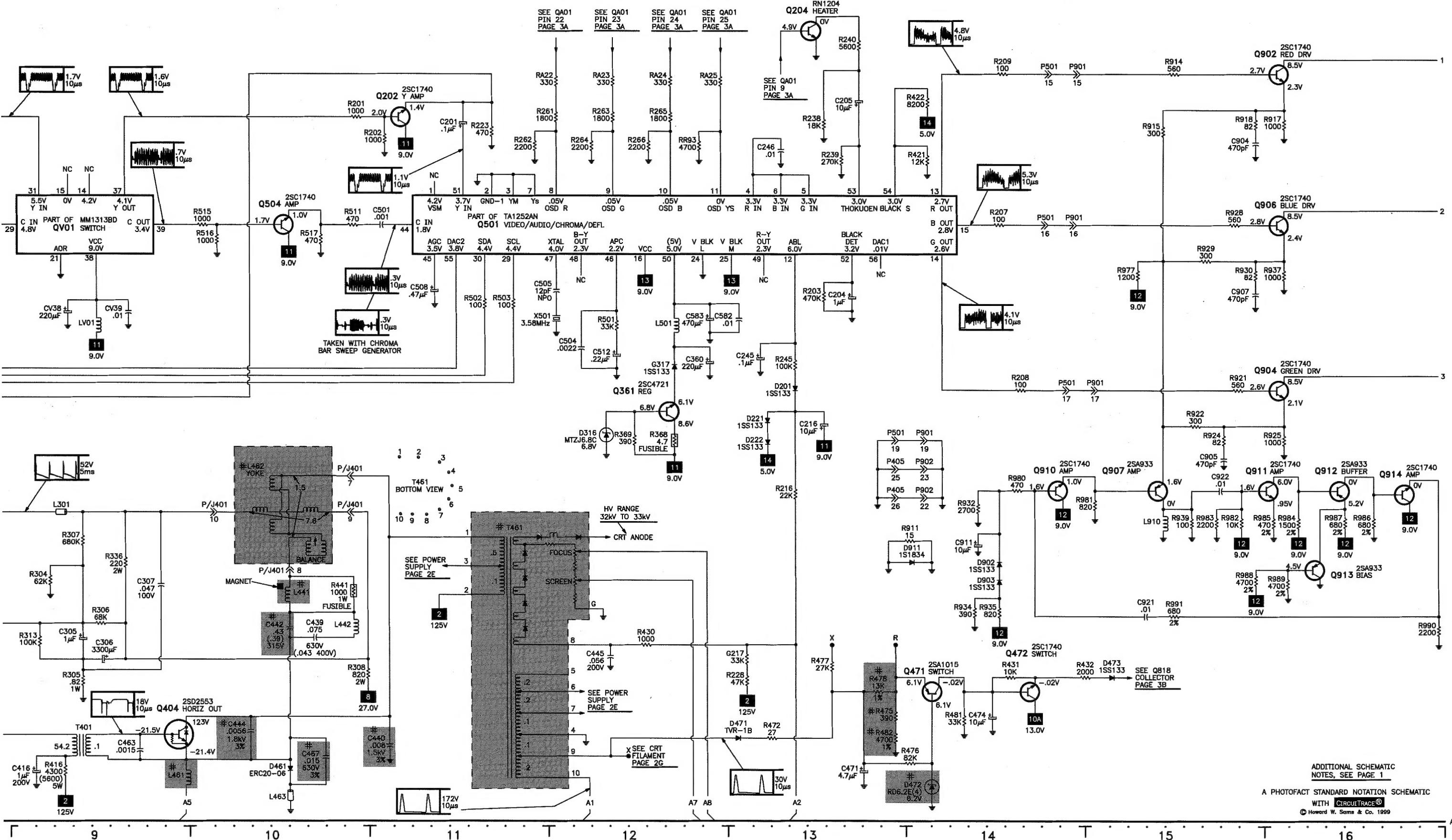
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## TELEVISION SCHEMATIC

B

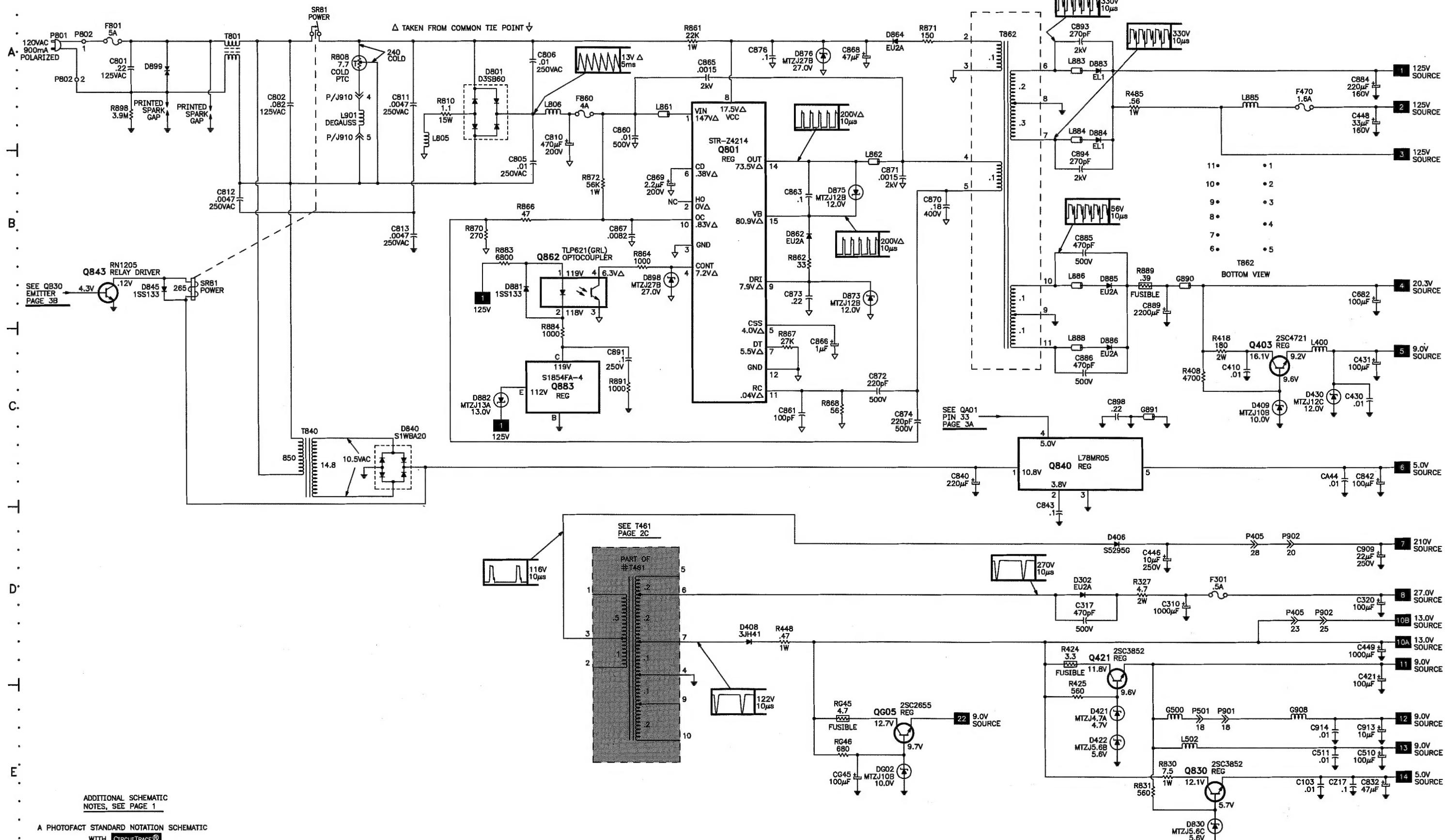


## TELEVISION SCHEMATIC continued



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## POWER SUPPLY SCHEMATIC



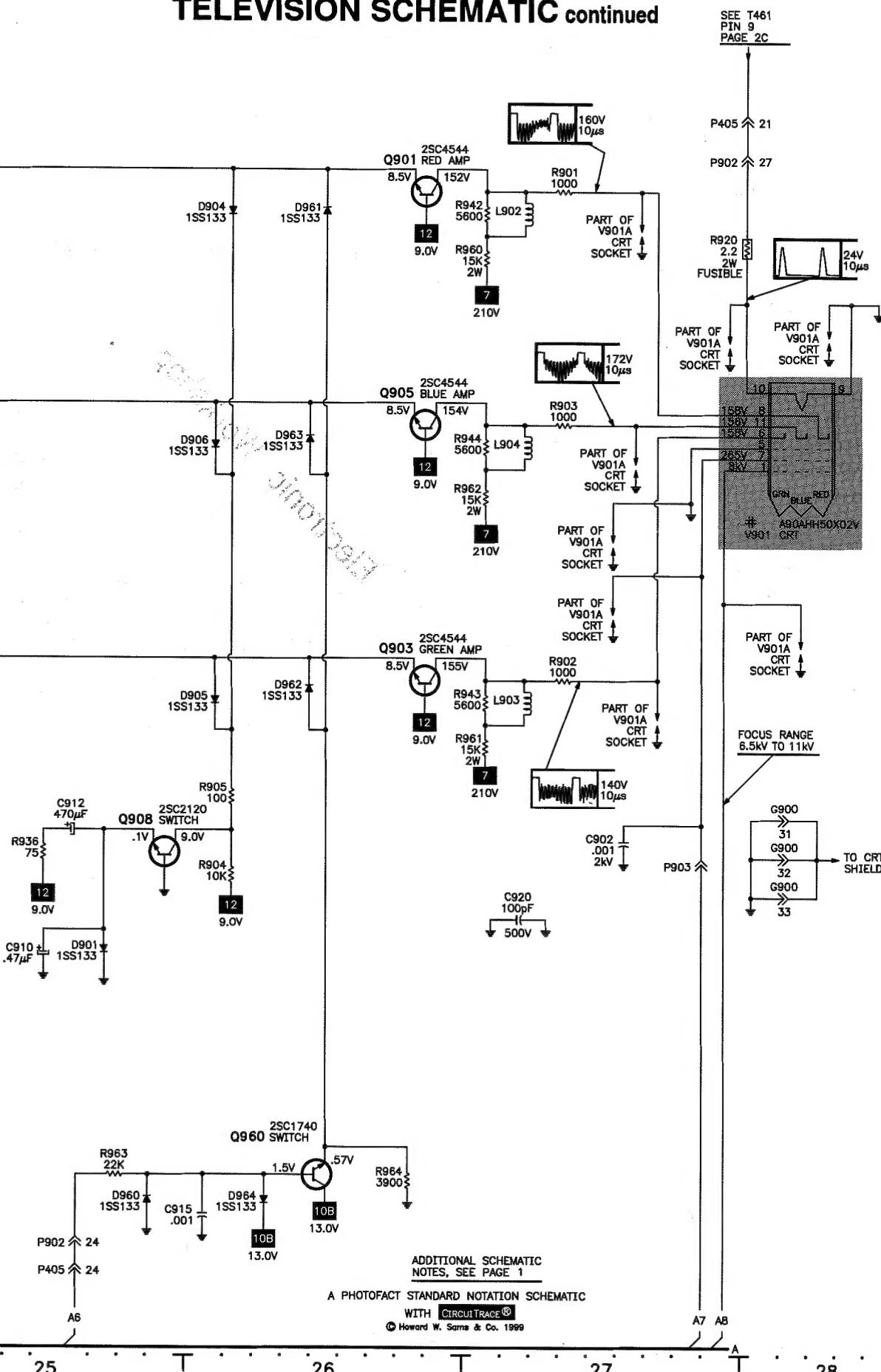
6

ADDITIONAL SCHEMATIC  
NOTES, SEE PAGE 1

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
WITH CIRCUITTRACE®  
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**G**  
**TELEVISION SCHEMATIC** continued

SEE T461  
PIN 9  
PAGE 2C



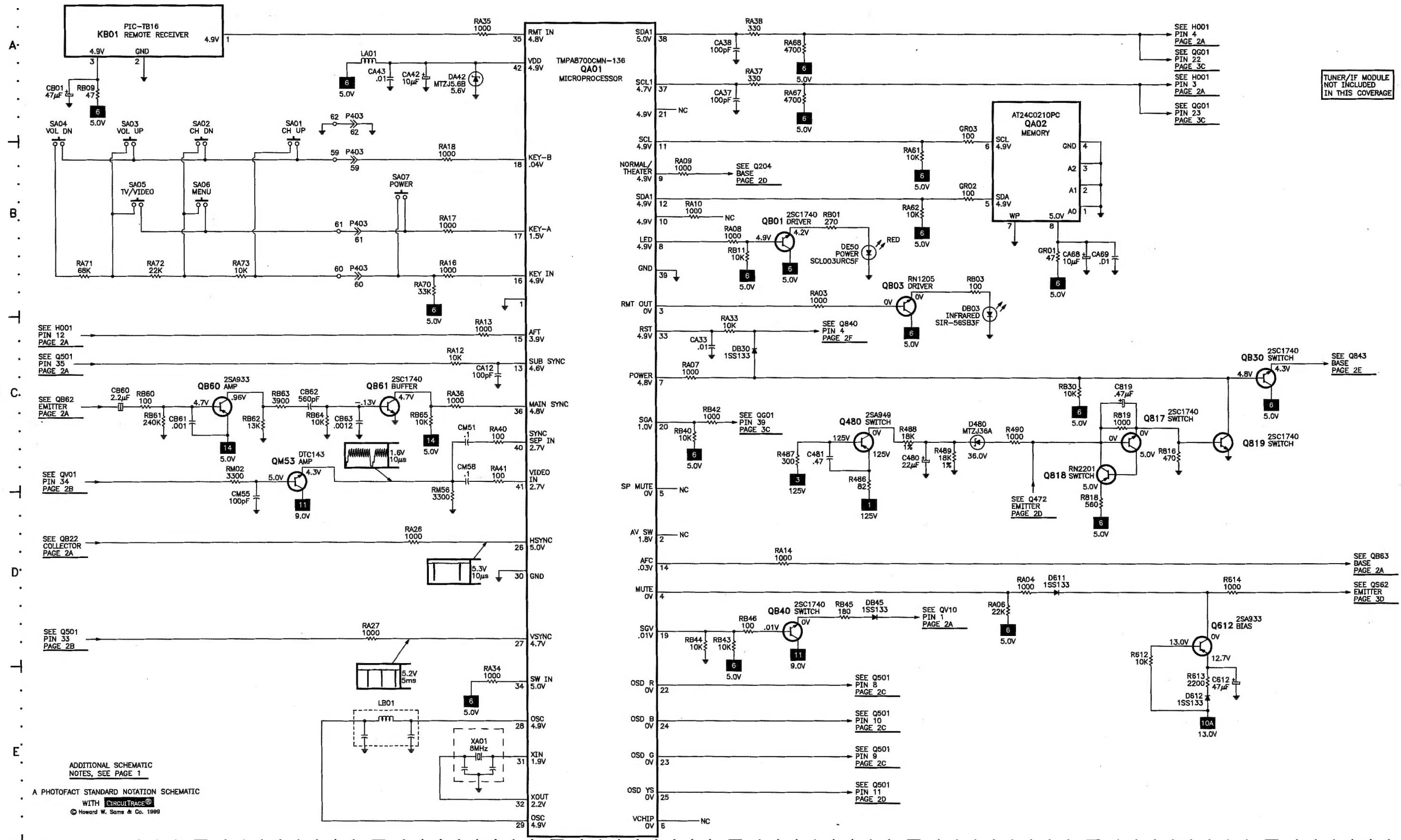
## SCHEMATIC COMPONENT LOCATION GUIDE

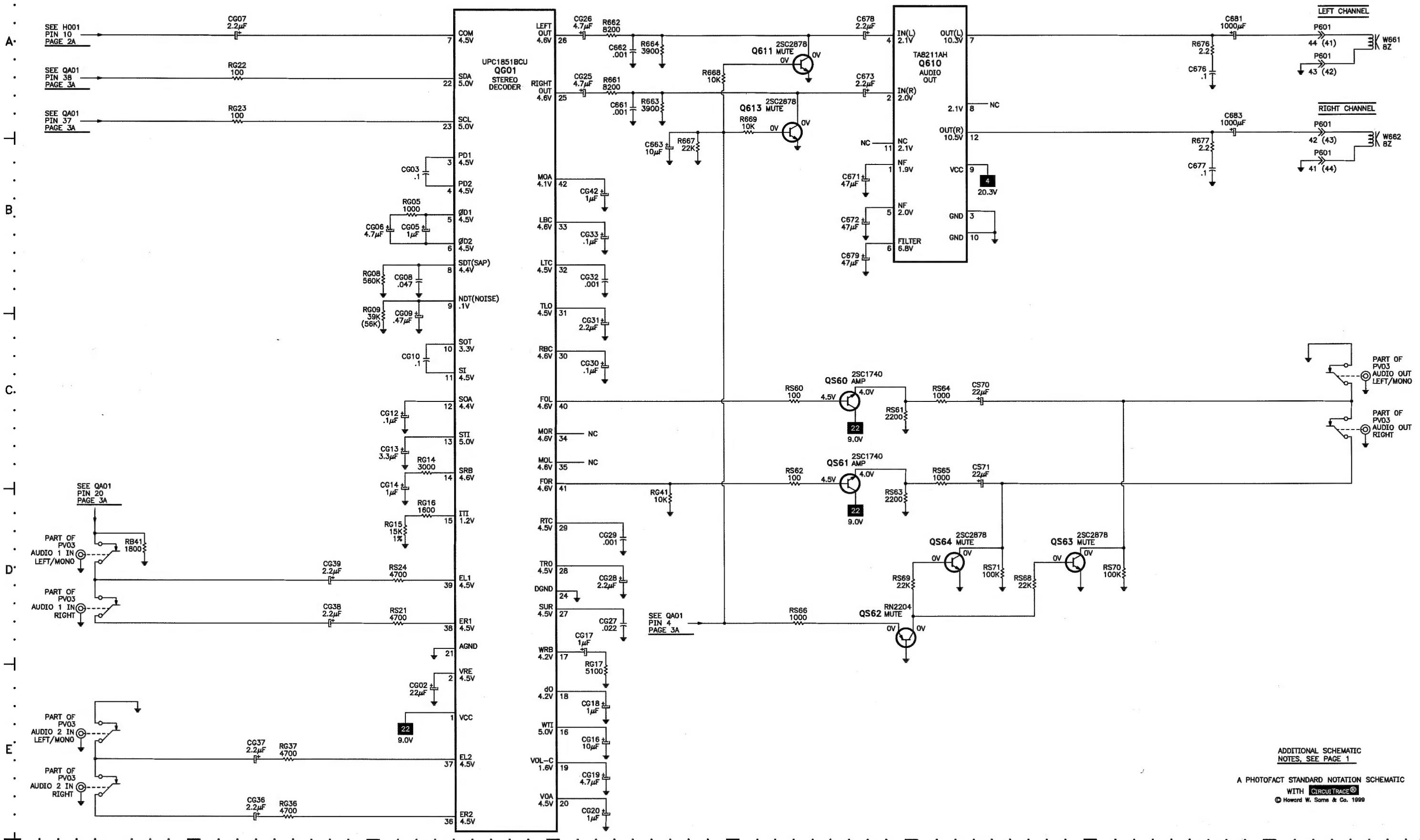
C102	B1	C810	B19	CM51	C31	DA42	A31	Q817	C35	R364	E3	R902	C27	RB45	D33
C103	E24	C811	A19	CM55	D30	DB03	C34	Q818	C35	R368	C12	R903	B27	RB46	D32
C105	B1	C812	B18	CM58	D31	DB30	C33	Q819	C35	R369	C12	R904	D26	RB60	C29
C106	B1	C813	B19	CS70	C42	DB45	D33	Q830	E23	R401	D2	R905	C26	RB61	C29
C201	B11	C819	C35	CS71	D42	DE50	B33	Q840	C22	R403	C4	R911	D13	RB62	C30
C204	C13	C832	E24	CV01	A4	DG02	E21	Q843	B17	R404	E6	R914	A15	RB63	C30
C205	A13	C840	C22	CV03	A4	DV01	A4	Q862	B19	R405	E1	R915	B15	RB64	C30
C216	C13	C842	C24	CV05	A3	DV03	B3	Q883	C19	R407	D1	R917	B16	RB65	C31
C245	C13	C843	D22	CV13	A4	DV05	A3	Q901	A26	R408	C23	R918	B15	RB66	B2
C246	B13	C860	B20	CV29	B8	DV13	A5	Q902	A16	R410	E7	R920	B27	RB67	C2
C305	D9	C861	C21	CV31	B8	F301	D23	Q903	C26	R411	E7	R921	C15	RF IN	A1
C306	E9	C863	B21	CV36	C4	F470	A23	Q904	C16	R415	E8	R922	C15	RG05	B39
C307	D9	C865	A20	CV38	C9	F801	A17	Q905	B26	R416	E9	R924	C15	RG08	B39
C308	D8	C866	C21	CV39	C9	F860	A20	Q906	B16	R418	C23	R925	C16	RG09	C39
C309	D7	C867	B20	CV41	B3	G217	E13	Q907	D15	R421	B14	R928	B15	RG14	C39
C310	D23	C868	A21	CV60	A6	G317	C12	Q908	D25	R422	A14	R929	B15	RG15	D39
C311	D8	C869	B20	CV61	A6	G500	E23	Q910	D14	R424	D22	R930	B15	RG16	D39
C313	D8	C870	B22	CZ01	B6	G890	B23	Q911	D15	R425	E22	R932	D14	RG17	E40
C314	D7	C871	B21	CZ02	B7	G891	C23	Q912	D16	R430	E12	R934	D14	RG22	A38
C315	D3	C872	C21	CZ03	B7	G908	E23	Q913	D16	R431	E14	R935	D14	RG23	B38
C317	D22	C873	B21	CZ04	B7	GR01	B34	Q914	D16	R432	E14	R936	D25	RG36	E38
C319	D8	C874	C21	CZ05	B7	GR02	B34	Q960	E26	R441	D10	R937	B16	RG37	E38
C320	D24	C876	A21	CZ07	B6	GR03	B34	QA01	A32	R448	D21	R939	D15	RG41	D40
C322	D7	C884	A24	CZ08	B6	H001	B2	QA02	B34	R456	E1	R942	A27	RG43	B2
C323	D6	C885	B22	CZ09	B6	KB01	A29	QB01	B33	R457	D3	R943	C27	RG44	B2
C325	D6	C886	C22	CZ11	C7	L101	B1	QB03	C33	R460	D5	R944	E21	RG45	E21
C326	D3	C889	B23	CZ12	C8	L301	D9	QB22	C2	R461	E4	R960	B27	RG46	E21
C337	D6	C891	C20	CZ13	B7	L400	C24	QB30	C35	R462	D4	R961	C27	RM02	D30
C360	C12	C893	A22	CZ14	B7	L441	D10	QB40	D33	R463	D5	R962	B27	RM56	D31
C402	D1	C894	B22	CZ15	B8	L442	D10	QB60	C30	R464	E4	R963	E25	RR93	B12
C403	C4	C898	C22	CZ16	B8	L461	E9	QB61	C30	R465	E5	R964	E26	RS21	D39
C404	C4	C902	D27	CZ17	E24	L462	D10	QB62	B2	R466	D5	R977	B15	RS24	D39
C405	E6	C904	B15	CZ18	C5	L463	E10	QB63	C3	R467	E5	R980	D14	RS60	C41
C406	E6	C905	C15	D101	B1	L501	C12	QG01	A39	R468	E5	R981	D15	RS61	C41
C410	C23	C907	C15	D201	C13	L502	E23	QG05	E21	R469	E6	R982	D15	RS62	D41
C413	E8	C909	D24	D221	C13	L805	B19	QM53	D30	R470	E5	R983	D15	RS63	D41
C415	E6	C910	D25	D222	C13	L806	A19	QS60	C41	R472	E13	R984	D16	RS64	C42
C416	E9	C911	D14	D301	D8	L861	A20	QS61	D41	R473	E5	R985	D16	RS65	D42
C417	E8	C912	D25	D302	D22	L862	B21	QS62	D41	R474	E5	R986	D16	RS66	D41
C421	D24	C913	E24	D308	D8	L883	A22	QS63	D42	R475	E13	R987	D16	RS68	D42
C431	C24	C914	E24	D309	D8	L884	B22	QS64	D42	R476	E13	R988	D15	RS69	D41
C439	D10	C920	D27	D314	D3	L885	A23	QV01	B4	R477	E13	R989	D16	RS70	D43
C440	E11	C921	D15	D315	E3	L888	C22	QV01	B9	R478	E13	R990	D16	RS71	D42
C442	D10	C922	D15	D316	C12	L901	A18	QZ01	B6	R482	E13	RA03	C33	RV01	A2
C444	E10	CA12	C31	D406	D22	L902	A27	QZ02	B8	R485	A23	RA04	D34	RV03	A4
C445	E12	CA33	C32	D408	D20	L903	C27	QZ03	B8	R486	D33	RA06	D34	RV07	B3
C446	D23	CA37	A32	D409	C23	L904	B27	QZ04	B6	R487	C33	RA07	C32	RV08	B2
C448	A24	CA38	A32	D411	E4	L910	D15	R	E13	R488	C33	RA08	B32	RV19	C4
C449	D24	CA42	A31	D421	B22	LA01	A30	R101	B1	R489	C34	RA09	B32	RV20	C4
C457	D3	CA43	A31	D422	E22	LB01	E30	R201	B10	R490	C34	RA10	B32	RV60	A6
C463	E9	CA44	C24	D430	C24	LV01	C9	R202	B11	R501	C12	RA12	C31	RV61	A5
C464	E5	CA68	B34	D441	E1	LZ01	C6	R203	C13	R502	C11	RA13	C31	RV62	A6
C466	D4	CA69	B35	D461	E10	LZ02	B6	R207	B14	R503	C11	RA14	D33	RV63	A6
C467	E10	CB40	C3	D467	E5	LZ04	B6	R209	A14	R515	B10	RA17	B31	RZ01	B7
C471	E13	CB60	C29	D471	E13	LZ05	B7	R216	D13	R516	B10	RA18	B31	RZ03	B8
C474	E14	CB61	C29	D472	E14	LZ11	C5	R223	B11	R517	B10	RA22	A12	RZ04	B8
C477	E5	CB62	C30	D473	E15	P801	A17	R228	E13	R612	D35	RA23	A12	RZ05	C7
C478	E5	CB63	C30	D480	C34	PV03	A1	R238	B13	R613	E35	RA24	A12	RZ07	C6
C479	E6	CG02	E39	D499	D4	PV03	A4	R239	B13	R614	D35	RA25	A12	RZ08	B6
C480	C34	CG03	B39	D611	D34	PV03	A7	R240	A13	R661	A40	RA26	D31	RZ09	B5
C481	C33	CG05	B39	D612	E35	PV03	C44	R245	C13	R662	A40	RA27	D30	SA01	B30
C498	D1	CG06	B39	D801	A19	PV03	C44	R261	B12	R663	A40	RA33	C32	SA02	B29
C499	E4	CG07	A38	D830	E23	PV03	D37	R262	B11	R664	A40	RA34	E31	SA03	B29
C501	B11	CG08	B39	D840	C19	PV03	D37	R263	B12	R667	B40	RA35	A31	SA04	B29
C504	C12	CG09	C39	D845	B17	PV03	E37	R264	B12	R668	A40	RA36	C31	SA05	B29
C505	C12	CG10	C39	D862	B21	PV03	E37	R265	B12	R669	B41	RA37	A33	SA06	B29
C508	C11	CG12	C39	D864	A21	Q202	B11	R266	B12	R676	A43	RA38	A33	SA07	B31
C510	E24	CG13	C39	D873	B21	Q203	C6	R270	C6	R677	B43	RA40	C31	SR81	A18
C511	E24	CG14	D39	D875	B21	Q204	A13	R271	C6	R808	A18	RA41	D31	SR81	B17
C512	C12	CG16	E40	D876	A21	Q301	D7	R272	C6	R810	A19	RA61	B33	T401	E5
C582	C13	CG17	D40	D881	B19	Q360	E3	R301	D7	R816	C35	RA62	B33	T461	D11
C583	C12	CG18	E40	D882	C19	Q361	C12	R303	D8	R818	D34	RA67	A33	T461	D20
C612	E35	CG19	E40	D883	A22	Q402	E7	R304	D9	R819	C35	RA68	A33	T801	A18
C661	A40	CG20	E40	D884	B22	Q403	C23	R305	E9	R830	E23	RA70	B31	T840	C18
C662	A40	CG25	A40	D885	B22	Q404	E9	R306	D9	R831	E23	RA71	B29	T862	A22
C663	B40	CG26	A40	D886	C22	Q421	E22	R307	D9	R861	A20	RA72	B29	V901	C28
C671	B41	CG27	D40	D898	B20	Q460	D5	R308	E11	R862	B21	RA73	B30	W661	A44
C672	B41	CG28	D40	D899	A17	Q461	D4	R309	D8	R864	B20	RB01	B33	W662	B44
C673	A41	CG29	D40	D901	D25	Q462	E5	R313	D9	R866	B19	RB03	B34	X	E13
C676	A43	CG30	C40	D902	D14	Q471	E14	R314	D3	R867	C21	RB09	A29	X401	D2
C677	B43	CG31	C40	D903	D14	Q472	E14	R315	D3	R868	C21	RB11	B33	X501	C12
C678	A41	CG32	B40	D904	A26	Q480	C33	R316	D2	R870	B19	RB21	C1	XAO1	E31
C679	B41	CG33	B40	D905	C26	Q501	B11	R317	D8	R871	A21	RB22	C2		
C681	A43	CG36	E38	D906	B26	Q501	D2	R327	D23	R872	B20	RB23	C2		
C682	B24	CG37	E38	D911	D13	Q504	B10	R328	D3	R883	B19	RB30	C34		
C683	B43	CG38	D38	D960	E25	Q610	A42	R336	D9	R884	C19	RB40	C32		
C801	A17	CG39	D38	D961	A26	Q611	A41	R360	D3	R889	B23	RB41	D37		
C802	A18	CG42	B40	D962	C26	Q612	D35	R361	E3	R891	C20	RB42	C32		
C805	B19	CG44	B2	D963	B26	Q613	B41	R362	D2	R898	A17	RB43	D32		
C806	A19	CG45	E21	D964	E26	Q801	B20	R363	E3	R901	A27	RB44	D32		

A

## SYSTEM CONTROL SCHEMATIC

B

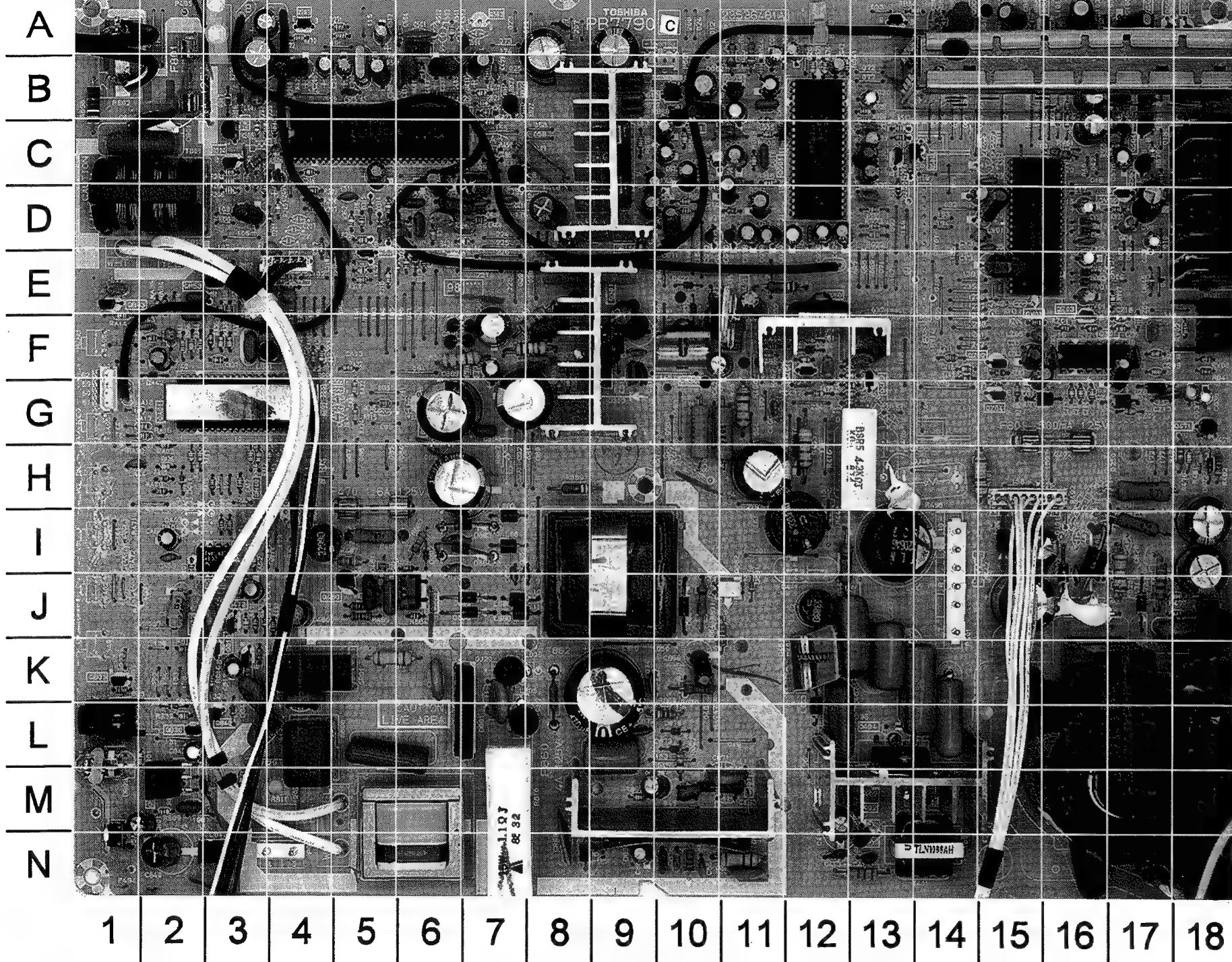




ADDITIONAL SCHEMATIC  
NOTES, SEE PAGE 1

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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# MAIN BOARD



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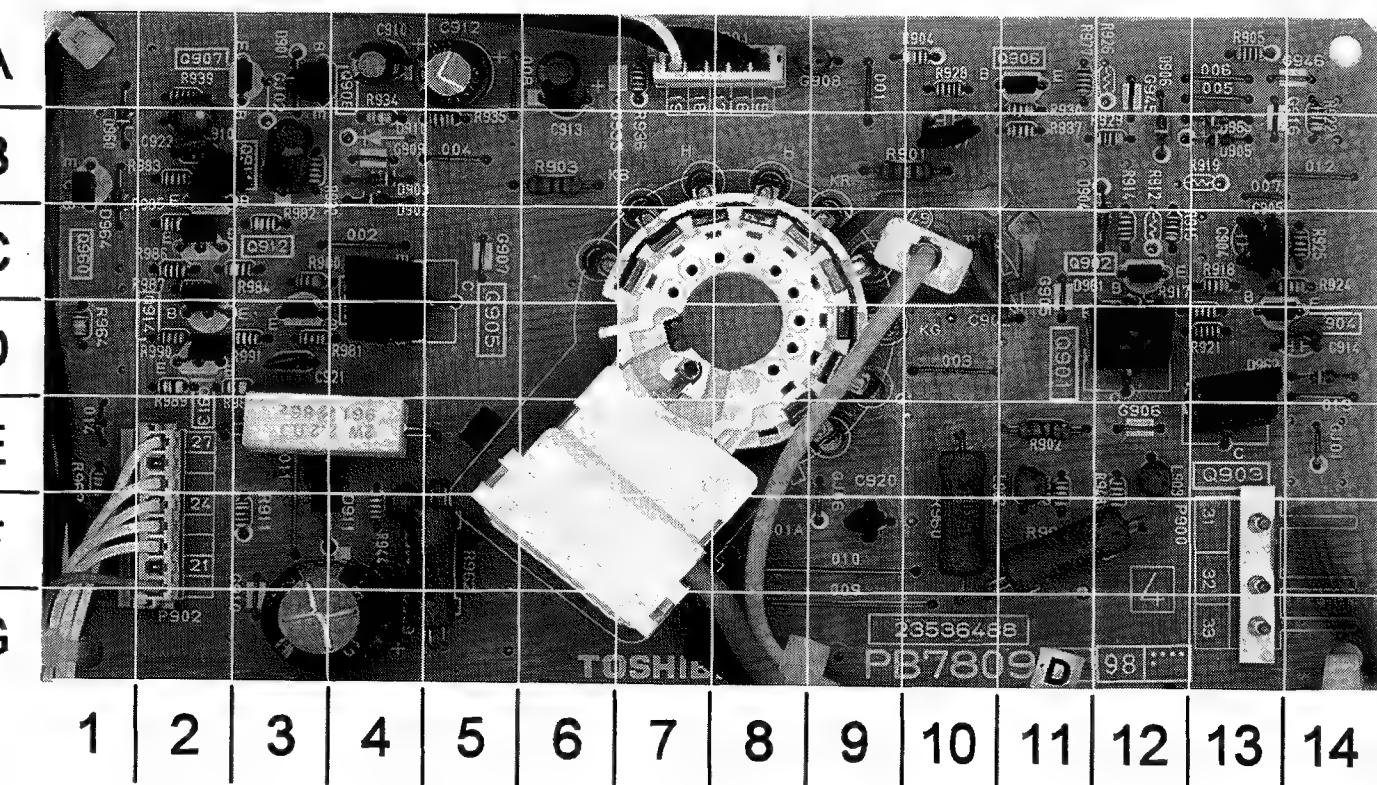
## MAIN BOARD, GRIDTRACE LOCATION GUIDE

C102	A16	C505	B5	CB40	E1	CZ15	F15	G317	B3
C103	A16	C508	B5	CB60	A15	CZ16	F17	G500	D4
C105	A17	C510	C5	CB61	A14	CZ17	G17	G890	F6
C106	A17	C511	D5	CB62	A14	CZ18	F14	G891	F6
C201	B5	C512	A5	CB63	A14	D101	D4	GR01	I2
C204	B4	C582	B3	CG02	A11	D201	D4	GR02	I3
C205	B4	C583	B3	CG03	B11	D221	E6	GR03	I3
C216	D3	C612	J2	CG05	B11	D222	D6	H001	B18
C245	C4	C661	D9	CG06	B10	D301	F9	KB01	L1
C246	C4	C662	C9	CG07	A11	D302	I16	L101	A16
C305	F7	C663	C10	CG08	C11	D308	E8	L301	F8
C306	G7	C671	D10	CG09	C11	D309	F8	L400	D7
C307	F8	C672	C10	CG10	C11	D313	E6	L441	I13
C308	F7	C673	D9	CG12	C10	D314	D5	L442	J12
C309	F9	C676	B9	CG13	D10	D315	D5	L461	I12
C310	I18	C677	B9	CG14	D11	D316	B3	L463	L12
C311	F9	C678	C9	CG16	D11	D406	I15	L501	B3
C313	F8	C679	C10	CG17	D11	D408	I16	L502	E4
C314	F9	C681	A8	CG18	D11	D409	C8	L805	L8
C315	D6	C682	D8	CG19	D11	D411	B6	L806	K7
C317	I16	C683	A9	CG20	D12	D421	E10	L861	N8
C319	D5	C801	C2	CG25	D12	D422	E10	L862	N11
C320	F9	C802	L5	CG26	D12	D430	D7	L883	I7
C322	C6	C805	K7	CG27	D13	D441	I17	L884	I7
C323	D6	C806	K6	CG28	C13	D461	K12	L885	I4
C325	D6	C810	K9	CG29	D12	D464	F12	L886	J7
C326	E5	C811	K4	CG30	B13	D467	H12	L888	J7
C337	B6	C812	L3	CG31	C13	D471	J17	LA01	F2
C360	A3	C813	K3	CG32	C13	D472	H18	LB01	F4
C402	B6	C819	K3	CG33	C13	D473	J3	LV01	D15
C403	B7	C832	E11	CG36	G18	D480	J4	LZ01	G17
C404	B7	C840	N2	CG37	G18	D499*	G11	LZ02	G16
C405	D6	C842	L2	CG38	D17	D611	H2	LZ03	G17
C406	D7	C843	M2	CG39	D17	D612	J3	LZ04	G17
C410	D7	C860	N8	CG42	D12	D801	L7	LZ05	F15
C413	N12	C861	N10	CG44	A12	D830	E10	LZ11	F14
C415	B6	C863	M11	CG45	B10	D840	N3	P401	J14
C416	N12	C865	N11	CM51	E2	D845	L3	P403	G1
C417	N13	C866	N9	CM55	E3	D862	M10	P405	H15
C421	F10	C867	N10	CM58	F2	D864	J10	P501	E4
C430	D7	C868	K10	CS70	C17	D873	L10	P601	B9
C431	D7	C869	M9	CS71	C17	D875	N11	P802	A1
C439	J13	C870	L9	CV01	E16	D876	L10	P910	N4
C440	L14	C871	M11	CV03	E16	D881	J11	PV01	F18
C442	K13	C872	L9	CV05	D16	D882	I6	PV03	C18
C444	K14	C873	M10	CV13	D16	D883	I7	Q202	C13
C445	I18	C874	K9	CV29	C15	D884	I7	Q203	A4
C446	I15	C876	N10	CV31	D15	D885	J7	Q204	C3
C448	J15	C884	H6	CV36	D15	D886	J7	Q301	F9
C449	I16	C885	J8	CV38	E15	D898	N9	Q360	E5
C457	D6	C886	J7	CV39	D15	D899	B2	Q361	C3
C463	M14	C889	G6	CV41	E15	DA42	F2	Q402	N13
C464	H11	C891	J5	CV60	C16	DB03	L1	Q403	C7
C466	G11	C893	I6	CV61	D17	DB30	L2	Q404	L13
C467	L12	C894	I6	CZ01	F16	DB45	E17	Q421	F11
C471	J18	C898	G7	CZ02	F15	DE50	L1	Q460	E12
C474	J3	CA12	H3	CZ03	F16	DG02	B11	Q461	F12
C477	G12	CA33	F4	CZ04	G16	DV01	E16	Q462	G13
C478	F12	CA37	F3	CZ05	F17	DV03	E16	Q471	G18
C479	F13	CA38	F2	CZ07	F17	DV05	D16	Q472	J3
C480	J4	CA42	F2	CZ08	F17	DV13	D16	Q480	J5
C481	J5	CA43	F2	CZ09	F17	F301	G16	Q501	C4
C498	C7	CA44	H1	CZ11	F17	F470	H5	Q504	C14
C499	B7	CA68	I2	CZ12	F17	F801	B2	Q610	D9
C501	A6	CA69	I2	CZ13	G16	F860	K8	Q611	B10
C504	A6	CB01	M2	CZ14	G16	G217	H13	Q612	J2

# CRT BOARD

## MAIN BOARD, GRIDTRACE LOCATION GUIDE continued

Q613	B10	R309	F8	R503	B7	RA62	I3	RV60	C16				
Q801	M9	R313	G8	R511	A6	RA67	E3	RV61	C16				
Q817	K3	R314	E6	R515	C13	RA68	E3	RV62	D17				
Q818	K3	R315	D6	R516	C13	RA70	H1	RV63	D17				
Q819	K2	R316	D5	R517	C13	RB01	L2	RZ01	F16				
Q830	F10	R317	D4	R612	J3	RB03	K1	RZ02	F16				
Q840	M2	R327	H17	R613	K3	RB09	M2	RZ03	F15				
Q843	L3	R328	E5	R614	H3	RB11	M2	RZ04	F14				
Q862	J11	R336	G11	R661	D10	RB21	B7	RZ05	F17				
Q883	J6	R360	D5	R662	D10	RB22	B7	RZ07	G15				
QA01	G2	R361	E5	R663	D9	RB23	B7	RZ08	G15				
QA02	I3	R362	D5	R664	C10	RB30	L2	RZ09	F14				
QB01	M2	R363	D5	R667	C10	RB40	I4	SA07	N1				
QB03	K1	R364	D5	R668	B10	RB41	F18	SL02 *	B16				
QB22	B6	R368	C3	R669	B10	RB42	G4	SR81	K4				
QB30	L2	R369	C3	R676	C9	RB43	I4	T401	N14				
QB40	I3	R401	B6	R677	B9	RB44	H4	T461	L17				
QB60	A14	R403	B7	R808	L4	RB45	G5	T801	D2				
QB61	A13	R404	D7	R810	M7	RB46	I3	T840	M6				
QB62	A16	R405	I17	R816	K3	RB60	A15	T862	J9				
QB63	E1	R407	B7	R818	K2	RB61	A15	X	K18				
QG01	B12	R408	D8	R819	K3	RB62	A15	X401	A6				
QG05	B11	R410	M12	R830	G11	RB63	A14	X501	B5				
QM53	E3	R411	M13	R831	F11	RB64	A13	XA01	F3				
QS60	A17	R415	N13	R861	K5	RB65	A14	* Located on bottom of board.					
QS61	A18	R416	H13	R862	L10	RB66	A15						
QS62	A17	R418	C8	R864	J11	RB67	A15						
QS63	C17	R421	B4	R866	L10	RG05	B11						
QS64	C17	R422	C4	R867	M9	RG08	C11						
QV01	E16	R424	E11	R868	N10	RG09	C11						
QV60	D17	R425	E11	R870	K10	RG14	D11						
QZ01	F16	R430	J18	R871	J10	RG15	C11						
QZ02	F15	R431	J3	R872	N11	RG16	C11						
QZ03	E16	R432	J3	R883	I6	RG17	D11						
QZ04	G15	R441	I12	R884	J6	RG22	D13						
R	K18	R448	I17	R889	H8	RG23	D13						
R101	H15	R456	C7	R891	I6	RG36	B13						
R201	D13	R457	E6	R898	B1	RG37	B13						
R202	D13	R460	F11	RA03	H2	RG41	B12						
R203	C3	R461	F12	RA04	H2	RG43	A11						
R207	D4	R462	F11	RA06	H2	RG44	B11						
R208	D4	R463	H12	RA07	H2	RG45	A11						
R209	D4	R464	F11	RA08	H2	RG46	A11						
R216	E5	R465	F11	RA09	H2	RM02	E3						
R223	B14	R466	F12	RA10	H3	RM56	F2						
R228	H13	R467	G13	RA12	H3	RR93	F4						
R238	B3	R468	G13	RA13	H4	RS21	B12						
R239	C3	R469	F13	RA14	F1	RS24	B12						
R240	B4	R470	F13	RA16	G2	RS60	B18						
R245	D4	R472	J17	RA17	G2	RS61	B18						
R261	C3	R473	G12	RA18	G2	RS62	B18						
R262	C3	R474	G13	RA22	F5	RS63	A18						
R263	C3	R475	G18	RA23	G5	RS64	B17						
R264	C3	R476	H18	RA24	G5	RS65	A17						
R265	D3	R477	J18	RA25	F4	RS66	A17						
R266	D3	R478	H18	RA26	F4	RS68	C17						
R270	B5	R481	H18	RA27	F4	RS69	B17						
R271	B5	R482	H18	RA33	E4	RS70	C17						
R272	B4	R485	I5	RA34	E2	RS71	B17						
R301	F8	R486	J5	RA35	E2	RV01	E17						
R303	F8	R487	I5	RA36	F3	RV02	F18						
R304	G8	R488	J5	RA37	F3	RV03	D17						
R305	F6	R489	J5	RA38	F3	RV07	E17						
R306	G8	R490	J4	RA40	F2	RV08	F18						
R307	G8	R501	B5	RA41	F2	RV19	B16						
R308	G10	R502	C7	RA61	I3	RV20	B16						



A HOWARD W. SAMS GRIDTRACE™ PHOTO

## CRT BOARD, GRIDTRACE LOCATION GUIDE

C902	C10	D904	C12	P903	C10	R903	B6	R934	B4	R983	B2
C904	C13	D905	B13	Q901	D12	R904	A10	R935	B5	R984	C3
C905	C13	D906	B12	Q902	C12	R905	A13	R936	A7	R985	C2
C907	B10	D911	E3	Q903	D13	R911	F3	R937	B11	R986	C2
C909	G3	D960	B1	Q904	D13	R914	C12	R939	A2	R987	C2
C910	A4	D961	C12	Q905	C4	R915	C13	R942	E11	R988	D3
C911	B3	D962	D14	Q906	A11	R917	D13	R943	E12	R989	D2
C912	A5	D963	B13	Q907	A3	R918	C13	R944	F4	R990	D2
C913	A6	D964	C1	Q908	A3	R920	E4	R960	F10	R991	D3
C914	D14	G908	A9	Q910	D3	R921	D13	R961	F11	V901A	E7
C915 *	D1	L902	E11	Q911	B2	R922	B14	R962	F5		
C920	F9	L903	E12	Q912	C2	R924	C14	R963	E1		
C921	B2	L910	B2	Q914	C2	R925	C14	R964	D1		
D901	A3	P900	F13	Q960	B1	R928	A10	R977	A11		
D902	B4	P901	A8	R901	B10	R929	B12	R978	C3		
D903	B4	P902	F2	R902	E11	R930	A11	R981	D3		

\* Located on bottom of board.

## PARTS LIST

## SEMICONDUCTORS

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.	NTE Part No.	TCE Part No.
D101	HTZ33-12	23316411	-	-	-
D201, 21, 22	1SS133	23118859	ECG519	NTE519	SK3100
D301, 02	ERB44-06	23118095	ECG552	NTE552	SK9000
	EU2A	23118094	ECG552	NTE552	SK9000
D308, 09	ERB12-02	23118822	ECG552	NTE552	SK9000
D313, 14, 15	1SS133	23118859	ECG519	NTE519	SK3100
D316	MTZJ6.8C	23316679	-	-	-
D406	SS295G	A7978850	ECG552	NTE552	SK9000
D408	3JH41	A7580658	-	-	-
	RU4Z	24339479S	ECG580	NTE580	SK5036
D409	MTZJ10B	23316690	-	-	-
D411	MTZJ8.2B	23316684	-	-	-
	UZ8.2BSB	-	-	-	-
D421	MTZJ4.7A	23316665	-	-	-
D422	MTZJ5.6B	23316672	ECG5011T1	NTE5011T1	SK9968
	MTZ5.1B	23316669	ECG5010T1	NTE5010A	SK5A1
	RD5.6ESAB2	-	ECG5011A	NTE5011A	SK5A6
D430	MTZJ12C	23316720	-	-	-
	UZ129SC	-	-	-	-
D441	MTZJ9.1B	23316687	-	-	-
D461	ERC20-06	23316582	ECG598	NTE598	SK9859
D464	MTZJ2.2A	23316648	-	-	-
	RD2.2ESAB1	-	-	-	-
D467	1S1887	A7568719	ECG116	NTE116	SK3312
D471	TVR-1B	A7568460	ECG552	NTE552	SK9000
# D472	RD6.2E(4)	23115774	ECG5013A	NTE5013A	SK6A2
	RD4.7ESAB1	-	-	-	-
D473	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D480	MTZJ36A	23316757	-	-	-
	RD36ESAB1	-	-	-	-
D611	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D612	1SS133	23118859	ECG519	NTE519	SK3100
D801	D3SB60	23316391	ECG5310	NTE5310	SK5030
	RBV-406M	-	ECG5330	NTE5330	SK9972
D830	MTZJ5.6C	23316673	-	-	-
	RD5.6ESAB3	-	-	-	-
D840	S1WBA20	23316962	-	-	-
	S1WBA60	-	ECG5332	NTE5332	SK9232
D845	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D862, 64	EU2A	23118094	ECG552	NTE552	SK9000
D873, 75	MTZJ12B	23316719	-	-	-
	RD12ESAB2	-	-	-	-
D876	MTZJ27B	23316746	-	-	-
	RD27ESAB2	-	-	-	-
D881	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D882	MTZJ13A	23316721	-	-	-

# For SAFETY use only equivalent replacement part.

## SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.	NTE Part No.	TCE Part No.
D883, 84	EL1	23357021	-	-	-
	EL1LF-G2	-	-	-	-
D885, 86	EU2A	23118094	ECG552	NTE552	SK9000
D898	MTZJ27B	23316746	-	-	-
	RD27ESAB2	-	-	-	-
D899	ENC271D-14A	24000268	-	-	-
	TNR15G271K	-	-	-	-
	TRF3202	-	-	-	-
D901	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D902, 03	1SS133	23118859	ECG519	NTE519	SK3100
D904, 05, 06	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
D911	1S1834	A7568250	ECG552	NTE552	SK9000
D960	1SS133	23118859	ECG519	NTE519	SK3100
	1SS176	-	ECG177	NTE177	SK9091
D961, 62, 63	1SS133	23118859	ECG519	NTE519	SK3100
D964	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
DA42	MTZJ5.6B	23316672	ECG5011T1	NTE5011T1	SK9968
	RD5.6ESAB2	-	ECG5011A	NTE5011A	SK5A6
DB03	SIR-56SB3F	23358522	-	-	-
DB30	1SS133	23118859	ECG519	NTE519	SK3100
	1SS120-7	-	-	-	-
DB45	1SS133	23118859	ECG519	NTE519	SK3100
DE50	SCL003URC5F	23358501	-	-	-
DG02	MTZJ10B	23316690	-	-	-
	RD10ESAB2	-	-	-	-
DV01, 03, 05	MTZJ9.1A	23316686	-	-	-
	UZ9.1BSA	-	-	-	-
DV13	MTZJ9.1A	23316686	-	-	-
	UZ9.1BSA	-	-	-	-
G317	1SS133	23118859	ECG519	NTE519	SK3100
Q202, 03	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q204	RN1204	A6002040	ECG2359	NTE2359	SK9959
Q301	TA8427K	B0378560	-	-	-
Q360	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q361	2SC4721P	23314444	-	-	-
	2SC2655-Y	-	ECG293	NTE293	SK3849
Q402	2SC1569FA-5	A678971D	ECG376	NTE376	SK3219
Q403	2SC4721P	23314444	-	-	-
	2SC4721, Q	-	-	-	-
Q404	2SC2655Y	-	ECG293	NTE293	SK3849
	2SD2553FA	A6872801	-	-	-
Q421	2SC3852	23314141	ECG56%	NTE56%	SK9364%
	2SD1944H	-	-	-	-
	2SD1405BL	-	-	-	-
Q460	2SD2493(D)	23314938	-	-	-
	2SD2493, P	-	-	-	-

% Use insulating hardware supplied with replacement.

## PARTS LIST continued

## SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.	NTE Part No.	TCE Part No.
Q461	2SA933S-Q	23114530	ECG290A	NTE290A	SK9132
	2SA1015Y	-	ECG290A	NTE290A	SK9132
	2SA564A-Q,TH	-	-	-	-
Q462	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A
Q471	2SA1015-O	A6534036	ECG290A	NTE290A	SK9132
	2SA1015-Y	-	ECG290A	NTE290A	SK9132
Q472	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815-Y	-	ECG85	NTE85	SK3124A
Q480	2SA949-Y(C)	A6532853	ECG383	NTE383	SK9138
Q501	TA1252AN	B0385957	-	-	-
Q504	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q610	TA8211AH	B0376856	-	-	-
Q611	2SC2878-A(TE)	A6342206	-	-	-
Q612	2SA933S-Q	23114530	ECG290A	NTE290A	SK9132
Q613	2SC2878-A(TE)	A6342206	-	-	-
Q801	STR-Z4214	23906369	-	-	-
Q817	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A
	2SC1685-Q,TH	-	-	-	-
Q818	RN2201	A6012010	-	-	-
Q819	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A
Q830	2SC3852	23314141	ECG56%	NTE56%	SK9364%
	2SD1944H	-	-	-	-
	2SD1405BL	-	-	-	-
Q840	L78MR05	23318299	-	-	-
Q843	RN1205	A6002050	-	-	-
Q862	TLP621(GRL)	A8643135	ECG3098	NTE3098	SK10178
Q883	S1854FA-4	A6907777	-	-	-
Q901	2SC4544	A6368700	ECG376%	NTE376%	SK9362A%
Q902	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q903	2SC4544	A6368700	ECG376%	NTE376%	SK9362A%
Q904	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q905	2SC4544	A6368700	ECG376%	NTE376%	SK9362A%
Q906	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q907	2SA933S-Q	23114530	ECG290A	NTE290A	SK9132
	2SA1015Y	-	ECG290A	NTE290A	SK9132
Q908	2SC2120-Y(TE)	A6321265	ECG289A	NTE289A	SK3849
Q910, 11	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
Q912, 13	2SA933S-Q	23114530	ECG290A	NTE290A	SK9132
Q914, 60	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
QA01	TMPA8700CMN-136	23906358	-	-	-
	TMPA8700CMN-136	23906516	-	-	-
	TMPA8700CMN-128	-	-	-	-
QA02	AT24C0210PC	70129483	-	-	-
	ST24C02CB6	-	-	-	-
QB01	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1685-Q,TH	-	ECG85	NTE85	SK3124A
	2SC1815Y	-	ECG85	NTE85	SK3124A

% Use insulating hardware supplied with replacement.

## SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.	NTE Part No.	TCE Part No.
QB03	RN1205	A6002050	-	-	-
QB22	2SC752(G)TM-Y	A6734590	ECG85	NTE85	SK3122
QB30, 40	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A
QB60	2SA933S-Q	23114530	ECG290A	NTE290A	SK9132
	2SA1015Y	-	ECG290A	NTE290A	SK9132
QB61, 62	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A
QB63	RN1206	A6002060	-	-	-
QG01	UPC1851BCU	23906499	-	-	-
QG05	2SC2655-Y(C)	A6333346	ECG293	NTE293	SK3849
QM53	DTC143TN	23314360	-	-	-
QS60	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
QS61	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1740SA	-	-	-	-
QS62	RN2204	A6012040	ECG2360	NTE2360	SK9960
QS63, 64	2SC2878-A(TE)	A6342206	-	-	-
QV01	MM1313BD	23906364	-	-	-
QV60	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
QZ01	TC90A45P	B0410867	-	-	-
QZ02, 03, 04	2SC1740S-Q	23114528	ECG85	NTE85	SK3122
	2SC1815Y	-	ECG85	NTE85	SK3124A

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T. Clensy, G. Farrell, B. Fink,  
M. Herkless, J. Kocha, F. Malek,  
B. Medaris, R. Raus, B. Skinner

## PARTS LIST continued

### CAPACITORS & ELECTROLYTICS

Item No.	Rating	Mfr. Part No.
# C440	.008 3% 1.5kV	24082959
# C442	.43 5% 315V	-
	.39 5% 315V	24082920
# C444	.0056 3% 1.8kV	24082837
# C467	.015 3% 630V	24095883
C505	12pF 5% 50V NPO	24353120
C801	.22 20% 125VAC	24095670
C802	.082 20% 125VAC	24095852
C805, 06	.01 +80% - 20% 250VAC	24092300
C811, 12, 13	.0047 20% 250VAC	24092585
C865, 71	.0015 10% 2kV	24092347
C893, 94	270pF 10% 2kV	24092338
C902	.001 10% 2kV	24092345
CB60	2.2μF 20% 50V NP	24085944
CG16	10μF 20% 16V Tantalum	24704106

# For SAFETY use only equivalent replacement part.

### CONTROLS & RESISTORS

Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
R368	4.7 5% 1/4W Fusible	24545479	-
R416	4300 5% 5W	-	-
	5600 5% 5W	24019335	5W256
R424	3.3 5% 1/2W Fusible	24546339	-
R441	1000 5% 1W Fusible	24532102	F1W210
# R475	390 5% 1/6W	24366391	-
# R478	13K 1% 1/4W	24327133	-
# R482	4700 1% 1/4W	24327472	-
R488, 89	18K 1% 1/4W	24327183	-
R808	7.7 Cold PTC, 240 Cold	24000862	-
R810	1.1 5% 15W	24007873	-
R889	.39 5% 1/2W Fusible	24546398	-
R920	2.2 5% 2W Fusible	24000961	F2W2D2
R984	1500 2% 1/8W	24367152	EW215
R985	470 2% 1/8W	24367471	EW147
R986, 87	680 2% 1/8W	24367681	EW168
R988, 89	4700 2% 1/8W	24367472	EW247
R991	680 2% 1/8W	24367681	EW168
RG15	15K 1% 1/4W	24327153	-
RG45	4.7 5% 1/4W Fusible	24545479	-

# For SAFETY use only equivalent replacement part.

### COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.
G500	-	23289100
G890, 91	Ferrite Bead	23103775
G908	-	23289100
L101	-	23289220
L301	Ferrite Bead	23103880
L400	-	23238714
# L441	Horizontal Linearity	23233953
L442	-	23248122
# L461	-	23248179
# L462 (1)	Yoke Horiz 1.3mH Vert 10.9mH	-
L463	Ferrite Bead	23103880
L501	-	23289101
L502	47μH	23289470
L805, 06	-	23248213
L861, 62	Ferrite Bead	23103880
L883, 84	Ferrite Bead	23103880
L885	-	23248073
L886, 88	Ferrite Bead	23103880
L901	Degaussing	23200279
L902, 03, 04	-	23289221
L910	4.7μH	23237991
LA01	-	23289100
LB01	Oscillator	23262280
LV01	-	23289100
LZ01	-	23238708
LZ02, 03, 04	Ferrite Bead	23103880
LZ05	-	23289100
T401	Horizontal Drive	23224336
# T461 (2)	Horizontal Output	23236540
T801	Line Filter	23211708
T840	Power	23213513
T862	Converter	23217379

# For SAFETY use only equivalent replacement part.

(1) Bonded to CRT.

(2) Focus and screen controls are part of T461.

## PARTS LIST continued

MISCELLANEOUS			
Item No.	Description	Mfr. Part No.	Notes
F301	Fuse	23144908	.5Amp, 125V, Fast Acting
F470	Fuse	23144731	1.6Amp, 125V, Fast Acting
F801	Fuse	23144888	5Amp, 125V, Slow Blow
F860	Fuse	23144511	4Amp, 125V
# H001 (1)	Module	23321310	Tuner/IF, UHF/VHF, EL933L2
KB01	Receiver	23905177	Remote, PIC-TB16
P801	Line Cord	23372065	AC, Polarized
PV01	Jack	23365818	SVHS
PV03	Jack	23365848	Assembly
SA01	Switch	23145226	Channel Up
SA02	Switch	23145226	Channel Down
SA03	Switch	23145226	Volume Up
SA04	Switch	23145226	Volume Down
SA05	Switch	23145226	TV/Video
SA06	Switch	23145226	Menu
SA07	Switch	23145227	Power
SR81	Relay	23146564	Power
# V901	CRT	23312713	A90AHH50X02V
V901A	Socket	23902068	CRT
W661, 62	Speaker	23351088	2 1/4" X 5", 8 Ohms, 5W
X401	Crystal	23153721	503kHz
X501	Crystal	23153961	3.58MHz
XA01	Crystal	23153325	8MHz
	Fuse Holder	23165433	For F301, F470, F801 (2 Used, Each)
	PC Board	-	CRT, PB7809D
	PC Board	-	Main, PB7790C
	PC Board	-	Control, PB6292
	Transmitter	23306265	Remote, CT-9950

# For SAFETY use only equivalent replacement part.

(1) Contact TNI Electronics for replacement; order by part number on tuner.

CABINET PARTS	
Item	Mfr. Part No.
Back Cover	23426761
Back Terminal Holder	23470534
Front Cover	23510447
IR Window	23430300
Power Button	23444880
Power Button Spring	23836492
Remote Transmitter	
Battery Cover	23588307

### Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

### Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

### Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

▪ Custom Components Corporation (Chek-A-Color)	▪ Terrell & Nobis (TNI Electronics)
▪ NTE Electronics, Inc. (NTE)	▪ Sencore, Inc.
▪ Philips ECG Company (ECG)	▪ Thomson Consumer Electronics, Inc. (SK, TCE)

### TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR570
Generators		Capacitance Analyzer	LC102
RGB	CM2125	CRT Analyzer	CR7000
Multiburst Signal	VG91	AC Leakage Tester	PR570
Color Bar	VG91	Inductance Analyzer	LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	Field Strength Meter	SL753
Frequency Meter	SC3100	Transistor Tester	TF46
Hi-Voltage Probe	HP200	Horizontal Analyzer	HA-2500
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

TOSHIBA

MODEL CF36H40 (CHASSIS TAC9808)